



# **Industry Perspective on Benefits of NIRPS Solutions**

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# Who is Blue Origin?

*BLUE ORIGIN*

- Blue Origin is focused on developing vehicles and technologies to enable commercial human space transportation
- Founded in 2000 by Jeff Bezos, Founder and CEO of Amazon.com
- Long-term vision of increasing the number of people that can fly to space using safe, low-cost, highly reliable transportation
- Incremental long-term development plan
  - Reusable systems to increase reliability and lower operating costs
  - Vertical landing
  - Beginning with suborbital systems that prove out technologies for orbital flight



## About Blue (cont.)

BLUE ORIGIN

- Significant investment to date in team, capabilities, and facilities
  - Design and development
  - Engine testing
  - Vehicle manufacturing

West Texas Launch Site (Van Horn, TX)



Design, Development and Assembly Facility (Kent, WA)



Operations Control Center



Vehicle Processing Facility

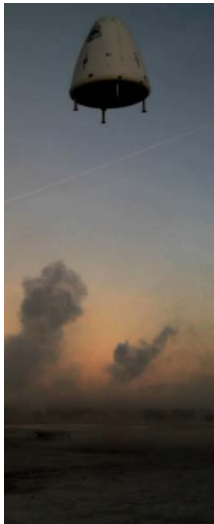


# Engine Development

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## BE-1

- 2,200 lbf
- $\text{H}_2\text{O}_2$  Monoprop
- Pressure fed



## BE-2

- 31,000 lbf
- $\text{H}_2\text{O}_2/\text{RP-1}$
- Pump fed



## BE-3

- 100,000 lbf
- $\text{LOx}/\text{LH}_2$
- Pump fed





# Crew Capsule Pad Escape Test

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- Integrated end-to-end test of Crew Capsule Escape System
  - Escape motor firing
  - Thrust vector control
  - Guidance and control
  - Parachute deployment
  - Landing
  - Recovery
- Fully successful test conducted Oct. 19 at West Texas Launch Site
  - Co-funded by NASA under CCDev 2 program





# What is Commercial Space?

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- Space efforts that adhere to commercial principles:
  1. Private sector ownership
    - Allows the capability to be offered to multiple customers
  2. “Skin in the Game”
    - A truly commercial endeavor should be able to attract substantial private investment
    - Government should be a minority share of development funding
      - 20% a good benchmark for overall development funding
      - If Government is the majority, then traditional acquisition is more appropriate
  3. Diverse customers
    - Private sector customers and preferably more than a single government agency
  4. Market driven:
    - Market-based pricing
    - Price point that permits private as well as government customers
    - Commercial contracting terms and conditions
      - i.e., services contracts, milestone-based payments, IP retention



# Partnering with Commercial Space

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- As industry changes, Government needs to partner with industry differently
  - Commercial space needs: markets, access to facilities and lessons learned, and partnerships
  - Enabling commercial space development benefits government, as well as industry
  - Government should be proactive and forward leaning
- Government can play a critical role in expanding U.S. propulsion development
  - Markets:
    - Commercial services contracting for launches, ISS crew and cargo, and future exploration activities
  - Access to Facilities:
    - National assets can enable commercial space development
    - Predictable, cost-effective access to Government facilities
  - Access to Lessons Learned:
    - Lessons learned from 50 years of spaceflight are invaluable to industry
    - Represents 50 years of public funding
    - Access provided on predictable, cost-effective terms
  - Partnerships:
    - Partner on novel, innovative propulsion and vehicle development – differs from Acquisitions
    - Partnering means:
      - Both partners contribute funds, i.e., majority of cost-share by industry
      - Industry retention of IP, enabling industry investment
      - Equal partners, not government-contractor roles



# Challenges

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- Working with Government agencies often takes significant time
  - Signing of Space Act Agreements with NASA has taken between 3-7 months from beginning of discussion
    - Different processes for different Centers
- Access to data not straightforward
  - Different procedures at different times, e.g., contract vehicle, SAA, or FOIA
  - Recent decision that ITAR-restricted materials are not releasable under FOIA
- Access to facilities carries costs
  - Underutilized facilities often priced out of range due to full cost accounting

Streamlined processes would greatly enhance  
industry interactions with Government



# Contact Info

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